

DATA BRIEFS . . .**○ Million-bit chips on the way?**

Do you remember when a 48K 8-bit personal computer was a real whopper just two or three years ago? Since then, with successive four-fold boosts in memory and logic circuit capacity, computers have steadily grown more powerful—from 4K to 16K to 64K. Even now, as 256K chips are just entering the market, their successor is already on the way. IBM has announced it has a chip that holds 1,048,576 memory cells within an 80.85 square-millimeter area of silicon.

There already are experimental 1M-byte chips, which can store up to 100 pages of double-spaced typewritten text, created by several other semiconductor firms. What makes this latest announcement noteworthy is that IBM's DRAM (for Dynamic Random Access Memory) chip was fabricated on the same mass production line used, since 1978, for manufacturing 64K and 72K chips. IBM's decision to incorporate the new chip into future systems may hang, therefore, on factors other than the technical know-how for producing it. (Some observers wonder whether there is, as yet, a sufficient market for personal computers incorporating 1M-byte chips.)

○ Sour on your computer? The Lemon Byte Society helps personal computer users whose hardware or software is not performing as promised. The Society documents user problems, contacts the suppliers and publishes *their findings in a monthly bulletin* for members. The annual membership fee is \$32. To obtain additional information, contact *The Lemon Byte Society, POB 558250, Miami, FL 33155. 305-386-3479.*

○ CP/M's comeback. After losing out to MicroSoft's MS-DOS as the dominant operating system for IBM-compatible computers, Concurrent CP/M-86 may be making a comeback. Strategic Incorporated, a San Jose-based research firm, reports on Digital Research's latest version of 16-bit CP/M OS for IBM PC's and other computers with 8088, 8086 and other Intel processors. This version combines multitasking,

(continued on page 7)

BARON'S MicroComputing REPORTS

Home computers make low-cost terminals.....	page 1
More than words processed	page 1
Link up with the right modem	page 3
Hands on review: Codewriter	page 4
Second computers	page 6

Home Computers as low-cost network terminals

Even quite small organizations can create networks in which the massive databases and powerful applications software of a central computer are simultaneously accessible to several remote terminals in the home or office. However, the cost of the terminals, ranging from several hundred dollars (for a very dumb machine) to several thousand (for a very smart terminal), can be prohibitive.

A solution to the high cost of network terminals that has been widely overlooked is that of using inexpensive home computers instead of dedicated terminals. A \$180 Commodore 64, a \$249 Atari 800XL (discounted price), or even an \$80 VIC-20 system can be as effective for your networking needs as a \$5,000 IBM 3270, and still function off-line as a free-standing computer.

The home computers/terminals can be linked to the central computer by dedicated hardware, an approach whose cost rises rapidly with the number of workstations, or via telephone. The latter's security and reliability are equal to those of direct connections. Furthermore, facilities are readily available in the form of the standard office multi-extension telephone network, so that workstations can be added at virtually no extra cost.

This article focuses on the use of Commodore home computers as network terminals because they are the least expensive system produced at the present time (though Atari ranks a close second), and because Commodore has been particularly active in the development of telecommunications equipment

(continued on page 2)

MORE THAN Words Processed

Word processing programs, having made it so much easier to create and revise documents, are perhaps the most heavily used software in a microcomputer owner's collection. Still, if the program is only creating reports and letters for you, it is probably being underutilized.

Many people find it difficult to conceive of a word processing program as anything other than a tool for composing text, probably because of the way it is marketed. But it can also be a tool for organizing text. True, there are any number of specialized programs for the same purpose, but not everyone can afford the cost of an average database or spreadsheet program (at least not for home use). Nor, for

that matter, does everyone need the power of such programs, especially if the amount of data being stored is relatively small.

With a little bit of ingenuity and some planning, a word processing program can do more than prepare and edit documents. It can keep track of information and activities, much as a database or scheduling program would—without the additional expense. While it cannot hope to rival a database manager's capabilities, it may contain features which function similarly—data entry with programmable keys (through boilerplates), updating (through search and replace), sorting (through block moves), specialized report generation (through

(continued on page 4)

Home Computers (continued)

and capabilities. These include, for instance, two low-cost modems — the under \$50 Model 1600, which provides for direct connect 300 baud communications; and the under \$90 Model 1650, which additionally provides auto-dial and auto-answer capabilities.

The major drawback to using an Atari computer as a terminal lies in its lack of a built-in RS-232C port. This means that in order to connect a modem to an Atari, an Atari 850 Interface Module is necessary. There are three exceptions — Atari's 1030 modem, Microbits' MPP-1000 modem, and Microperipheral's AutoPrint Modem. Of the three, the terminal software which comes with the Atari 1030 does not permit the up- and downloading of text and program files. Therefore, it cannot be recommended for any serious use.

Several cost-effective systems which can be configured from currently available hardware and software are listed below:

- **System I (\$300)** - This lowest-cost system consists of a VIC-20 computer, a Model 1600 modem, and an MSD VTE40 40-column terminal emulator software ROM cartridge. Because the software is in ROM, there is no need for a cassette recorder or a disk drive. This configuration has the added advantage of instant on-terminal emulation. In addition, a 40-column display replaces the inadequate VIC-20 22-column display.

- **System II (\$380)** - The entry-level system for the Atari computer includes an Atari 600XL and Microbits's direct-connect, MPP-1000 Modem. As with the VIC-20 System I, no disk drive or cassette recorder is needed.

- **System III (\$400)** - This system is a System I, upgraded to an 80-column display by adding a Data 20 Display Manager cartridge. The cartridge provides both terminal emulation software and 8K of expansion RAM. Adding a cassette recorder or a disk drive would allow the use of the word processing software included with this package.

- **System IV (\$700)** - This system includes a Commodore 64 computer, a 170K 1541 disk drive, a 1600 modem and full-featured terminal software from Micro Technic Solutions, Inc. The Commodore Easy Script word processor is also included to

allow the creation of text files off-line for subsequent uploading by the terminal software. This can substantially reduce connect time charges.

- **System V (\$800)** The Atari disk-based system involves adding an Atari 1050 drive for \$320 (discount price) and SuperText Professional Word Processor from MUSE. This configuration enables you to use all of the smart terminal features in the MPP-1000 software, such as the multiple buffers, up- and download capabilities, and the use of off-line editing. The software also allows you to transfer any files larger than the 16K RAM in the Atari 600XL.

- **System VI (\$1,170)** This deluxe package is similar to System IV, with the addition of a Data 20 Video Pak 80 cartridge for 80-column display, and a Commodore MPS-81 50cps dot matrix printer.

- **System VII (\$1,180)** At this price level, the Atari configuration can be altered considerably. Instead of the 16K Atari 600XL, a 64K Atari 800XL is used. Also, Microperipheral's AutoPrint Modem, a direct-connect, autodial and autoanswer device, and SmarTerm software are included. This enables the user to do two things: store and redial phone numbers automatically through the SmarTerm software and drive the Axiom AT-100 dot matrix printer — without the need of an Atari 850 Interface. (Although System II and V owners can

upgrade their 16K to a full 64K with any of a variety of memory cards, they would still need to purchase an interface in order to drive the printer.)

- **System VIII (\$1,150)** Instead of providing a direct 80-column display, this package uses the side scrolling features of Midwest Micro's SuperTerm software to provide 80 or 132-column capabilities. A standard ASCII printer, rather than a Commodore printer, is required. This combination of software, when used with the companion Smart ASCII interface and a standard ASCII non-Commodore printer, allows streaming of received data directly to the printer for on-line documentation. This package appears to be the only one that will support this feature in a Commodore system.

The Software

- **VIC Term 40. \$49.95, Micro Systems Development.** The VTE40 provides a 40-column display area for the VIC-20. Although the display is not as crisp as one would like, it is still quite usable. The software, in a ROM cartridge, enables full terminal emulation with up-and download capabilities to the disk drive as well as the printer. The VIC's built-in RAM is used as an online buffer.

- **Smart 64 Terminal Plus 3. \$49.95, Micro-technic Solutions.** This full-featured terminal emulation program supports multiple

ITEM	COST	I	II	III	IV	V	VI	VII	VIII
COMPUTERS									
VIC-20	\$100	X		X					
Commodore 64	\$200				X	X			X
Atari 600XL	\$150		X			X			
Atari 800XL	\$250							X	
MODEMS									
Commodore 1600 Modem	\$50	X		X	X				
Commodore 1650 Automodem	\$90					X	X		X
Microbits MPP1000 Modem	\$130		X		X				
Microperipheral AutoPrint	\$180							X	
SOFTWARE									
MSD VTE40	\$50		X						
MTS Smart Terminal Plus 3	\$50			X		X			
Data 20 Display Manager	\$150				X				
Data 20 Video Pak 80	\$180						X		
MWM SuperTerm	\$150							X	
MWM Smart ASCII Interface	\$60							X	
SmarTerm	\$50						X		
WORD PROCESSORS									
Commodore Easy Script	\$50				X	X			
MUSE SuperText	\$100					X	X		
PERIPHERALS									
Commodore 1541 Disk Drive	\$250			X		X			X
Atari 1050 Disk Drive	\$320				X		X		
Commodore MPS-801 Printer	\$250						X		
ASCII Printer	\$300							X	
Axiom AT-100	\$230							X	
Monochrome Monitor	\$100	X	X	X	X	X	X	X	X
TOTALS	\$300	\$380	\$400	\$700	\$799	\$1170	\$1180	\$1150	

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disk drives as well as the 80-column display from Data 20 Corporation and the 1650 Autodial modem. A 28K online buffer is provided. Besides the ability to up- and download text and program files, the program also has a number of built-in disk drive commands and the ability to save custom setup files.

• **SuperTerm.** \$149.95, *Midwest Micro, Inc.* This full-featured terminal emulation package emulates such popular telecommunication terminals as the VT100 and the VT102. User definition of terminal parameters is available. Although all display is in 40 columns, the package emulates 80 and 132-column operation with a side-scrolling feature. Up- and downloading of text and program files is fully supported. A built-in text editor (word processor) is included, allowing off line creation of data files.

When used in conjunction with the company's Smart ASCII printer interface, the program will stream received data to a printer.

• **SmarTerm.** \$49.95, *The Microperipheral Corporation.* This menu-driven, semi-window formatted terminal software for the Atari computer permits the user to up- and download program files as well as text. In addition, printing can be directed to the printer while still online or saved to disk and printed afterwards. The program follows the popular XModem protocol found on many bulletin boards. It also includes 26 phone numbers on disk and a 12K buffer. Another nice feature is the autodial and auto-redial support. Finally, author Jerry Wright (206/226-7644) will customize it, if necessary.

— M. A. Kevelson and V. Puglia

LINK UP WITH THE RIGHT MODEM CABLE

When there's trouble putting a modem on line, the likely gremlin is a mismatch between the computer and the modem cable. The wrong cable is the single biggest cause of modem problems, yet there's no great mystery as to what makes a sound computer-to-modem link. Modem manufacturers make several kinds of connectors for different computer configurations. Which one to use depends on your computer's serial port. The EIA RS-232C Interface, commonly called the RS-232 port, is one attempt to set a standard for the computer industry. You probably know about it, but you might not realize — and here's the source of all the trouble — that the RS-232 is not as much of a standard as it could be; it varies in two significant ways.

• Gender:

While the RS-232 is enclosed in a standardized metal clip (called, incidentally, the DB-25 housing), it comes in male and female versions. The male RS-232 port has up to 25 pins emerging from it; the female has 25 holes to receive the pins. For no rational reason, some computers have male RS-232's, some have females.

Whatever the gender of your computer's RS-232, you need a cable connector of the opposite sex. One important note: While a female RS-232 port has positions for 25 pins, don't worry if the male modem cable connector only has five or six pins showing. Modems (and most other serial port devices) don't use all 25 pin positions.

• Wiring:

The term "RS-232 Interface" really refers to the way the pins are wired, termed the "pinout." A computer's RS-232 is usually

wired so that it sends data from pin 2 and receives it on pin 3. This pinout configuration is typical of what is known as Data Terminal Equipment (DTE), jargon for "computer."

The pinout of a modem's RS-232 is complementary, receiving data on pin 2 and sending it from pin 3. This configuration characterizes Data Communications Equipment (DCE), the category to which modems belong. A compatible link between modem and computer demands that opposite pinouts be mated. It is important to remember whether the initials are DTE or DCE, not which pin sends or receives data.

Six other pins play a major role in the RS-232 wiring. They are pin 4 (Request To Send, output), pin 5 (Clear To Send, input), pin 6 (Data Set Ready, input), pin 7 (Common, mandatory reference point for all interface voltages), pin 8 (Data Carrier Detect, used to disable data reception on DTEs), and pin 20 (Data Terminal Ready, output).

So where is the problem? Well, perversely, some computer manufacturers wire their RS-232 interfaces as DCE rather than the more common DTE. And this is tough to spot. If a modem has LED lights, those that signal on/off and high baud rate will light up, signaling that all is well. Yet, for seemingly inexplicable reasons, the modem will not communicate.

• Tips:

Try a few carriage returns when your communications program is in "talk" mode. Watch the LED light that monitors data input and output. If it doesn't flash, your computer's output isn't being regis-

Software Suppliers

- Data 20 Corporation, 23011 Mouton Parkway, Suite 810, Laguna Hills, CA 92653, 714-770-2366.
- Microbits Peripheral Products, 434 W. First Street, Albany, Oregon 97321, 503-967-9075.
- Micro Systems Development, Inc., 10031 Monroe Drive, Suite 206, Dallas, TX 75229, 214-357-4434 or 800-527-5285.
- Microtechnic Solutions Inc., P.O. Box 2940, New Haven, CT 06515, 203-389-8383.
- Midwest Micro Inc., 311 West 72nd St., Kansas City, MI 64114, 816-333-7200.
- The Microperipheral Corporation, 2643 151st Pl. N.E., Redmond, WA 98052, 206-881-7544.

tered by the mode. A cable mismatch is the probable cause.

To find out if your computer's RS-232 has a DTE or a DCE pinout, try these steps:

- Look for any mention of the RS-232 serial port in your owner's manual. Check to see whether it's labeled DTE or DCE.
- If any documentation includes a schematic diagram of your serial port, see if pin 2 is labeled "Transmit Data," and if pin 3 is slugged as "Receive Data," or other words to that effect. If so, you have a typical DTE wiring. Opposite labeling means DCE.
- Ask your dealer to find out for you. Or call your computer manufacturer's hotline or executive headquarters.

Whether your modem comes with cables or you buy them separately, you'll have to specify the connector configuration. It should be opposite in gender and pinout (DCE or DTE) to that of your computer's RS-232 port. Fortunately, the cable end that plugs into the modem is factory-customized so you won't have to worry about that.

If you're already stuck with a mismatched cable, you still have a few resources. There are plugs called "gender changers" (about \$30) that can reverse the gender of a computer's RS-232. There are also plugs that reverse the pinout of any RS-232 for about the same price. If no compatible cable is in stock at your computer store, you could have one made by a dealer or shop that specializes in custom-built cables. It might not be much more expensive than a factory-made cable. You might even consider making your own cable, a growing activity of computer enthusiasts. Descriptions of gender changers, other plugs, and cable-making equipment can be found in most computer supply catalogs.

— James R. Berry

More Than Words Processed (continued)

file merging), and simple arithmetic.

Creating a database

How do you go about setting up a simplified data base with a word processor? First, data must be organized into a form which can be manipulated. Although a first-come, first-served filing system may seem adequate, it will not permit easy readability and accessing of data. Using an outline is a better approach since specific information can be entered beneath appropriate headings. Also, outlines are fairly easy to construct and maintain.

Let's consider an appointment calendar. The first task is to divide the file into the appropriate number of sections and set up a heading for each. If you center the section headings (or have them flush with the left margin), you can quickly spot the section you want (month, week or day) with the word processor's page-up, page-down feature. Within each section, the appropriate fields (appointments, deadlines or events) are entered. If your program permits variable margins, you can create further subdivisions by listing certain data within a distinctive format. Entries to be listed more

than once can be copied from one section to another.

When you enter data into a section, try to follow a consistent format. (It will help later if you want to retrieve that same information.) Consider whether it will be easier to find the record by searching for a name or category, or through some form of indexing. If one identifying word will suffice, try to keep that word at the beginning of the record. However, if you want to relate certain entries which might fall at different times on your calendar or have more than one category in common, it might be better to include a unique code within the record. For example, ten records which deal with personal finances might be coded P\$1 through P\$10. Appointments with your accountant could be labeled CPA#.

Once the data is entered, you need to establish a means of quickly accessing records. The search feature in a word processing program may not be equal to that of a database system, but it will serve your purpose well enough. Simply ask the program to search for a particular word or a unique symbol, such as those mentioned above, and the record is called on-screen. The only drawback is that the record is not

isolated as it would be in a specialized program, but this is a minor inconvenience. Once on-screen, the data can be revised either manually with the editing feature, or automatically with the replace feature.

If your program allows for columns and arithmetic calculations, you can create a simple spreadsheet. It may not be as comprehensive as Lotus 1-2-3 or VisiCalc, but it won't be as expensive, either. Even if your word processor doesn't permit columns, you can still create them with the tab feature—it just requires a little more planning.

The above example is meant to be only that—an example of utilizing the full capabilities of your word processing program. Although virtually anything that can be written on a piece of paper can be done with a word processor, only you can decide whether it should be computerized and how it must be organized. One more suggestion: By writing a short batch program which automatically boots your word processor and calls up the file, your appointment calendar (or data base or spreadsheet) can be put on-screen every morning so that you are prepared for that day's appointments. A batch file can also be used to call up any records coded as "ticklers".

HANDS ON...

• **CodeWriter.** Dynatech Microsoftware, Inc., 7847 N. Caldwell Avenue, Niles, IL 60648, \$12.470-0700. Atari and Commodore 64, \$99.; IBM, PCjr and Apple, \$199; IBM PC, Kaypro and TI Professional, \$249. (Atari version reviewed.)

CodeWriter is a program which allows you to develop your own vertical software. By simply answering the prompts, the program generates the Basic code. Once created, your program is loaded and runs on its own.

The first step in creating your own software is designing a screen layout of up to 50 fields. You can define labels, prompts and data fields. Permissible data fields are text, numeric, money and date. Numeric and money fields can be entered manually, calculated by the program, or be the total of all such fields in the files.

Once the screen has been saved, an application is created. You inform CodeWriter from where the grand total is to get its figures and what the formulas are for the various calculated fields. (The Commodore version allows calculated fields to be self-referencing; that is, a formula can be written so that the field is listed on both sides of the equation.) The program calculates the number of records possible, then asks how many are needed. It also asks for a key field.

The final step involves error handling. For each field, CodeWriter needs to know

if any conditions should be met before accepting any data entered. Aside from checking for field type (alphanumeric or numeric), field length, and required field, your program can reject data on the basis of content. For example, you can check to see if a field contains certain values or combinations of values. You can also write an error message.

File maintenance includes entering and updating records through the use of key fields, searches for related records and verification of grand totals. Updating a field which is used as part of another field causes the second field to be reprogrammed.

Designing a report program is even easier than creating the application program. Essentially, you begin by choosing which fields will appear in the report. After that, you decide how many fields should be displayed across the 80-column page, and how many lines deep. After entering the fields in their appropriate places on the screen, the program displays the report and asks you to verify it. You then define headings and page numbering. Finally, only records which fulfill the search criteria are printed. Up to 99 report screens can be designed.

A number of Report Creation System features make the program extremely interesting. One is an 80-column Commodore and Atari format, accomplished by flipping between two 40-column screens. The Atari

version can define additional calculated fields. Since new fields are assumed to be numeric, you must format them with two decimal places if they reflect dollar amounts. Finally, summaries of numeric fields can be included within the report. The summary feature lists the total, average, minimum and maximum of a particular field. A search feature permits access to Basic. Virtually any Basic statement can be used as search criteria.

The stapled, 60-page manual is filled with examples and sample screens. However, since it is written for the Commodore 64, the Atari owner must refer to two sheets of user notes. Dynatech is now considering a separate manual. But in view of the cost of the program, there should have been separate manuals from the start. The programs themselves contain documentation in the form of help screens, a listing of defined field names and user notes.

Early during the reviewing process, the CodeWriter program crashed and refused to generate any more application programs. When I called, the company was understanding and helpful, and suggested I return the disks for a replacement. This type of service is not special; every registered owner has up to a year from the date of purchase to replace any faulty disk. The warranty also allows you a free upgrade (if the retail price remains the same). Dynatech has a toll-free service number, and back-up disks cost \$15.

In conclusion, CodeWriter provides enough features to please many people. ■

► Why should diskettes be kept away from color monitors?

Color TV sets and many color monitors contain a coil that demagnetizes the shadow mask within the set when it is turned on. Since this coil, located around the face of the tube, is connected directly to the AC power supply, it carries a high-powered surge which eventually dissipates to nothing, creating a magnetic field. Diskettes, which retain data in magnetic form, are thus exposed to this strong demagnetizing field if they are within a foot of the front of the color set. As a result, they could lose data, perhaps not immediately, but this could probably happen over a period of time.

► What is an "expert system"?

Expert systems are programs that avail the user of high-level knowledge in a given field. Most expert programs available today—such as those for engineering, medical diagnostics, etc.—are found on mini or mainframes; however, a few are trickling down to the personal computer level.

Before an expert system can be designed, a recognized specialist must be interviewed regarding his or her methodology and decision processes. The information is then broken down, flowcharted and coded. Generally, the system is made up of two sections: a data base containing specific information, and a management system that manipulates the data according to the expert's methodology.

The user never sees all the alternatives in the system. He simply answers prompts until the desired result is achieved. In a few programs, the user can ask not only for recommendations but how they were reached. Some expert systems even allow the user to insert information into the program to reflect changing knowledge about the subject.

► What are shells?

A shell is a procedural program placed between the user and another program, or

INSIDE INFO

between two other programs. As the name implies, a shell is a framework containing everything but specifics. Before it can be used, the user needs to add the necessary details. (In this respect, shells are similar to template programs.)

For example, an application program shell to be used in conjunction with a windowing program might require the user to indicate which commands are to be displayed on the main menu screen or whether a mouse was being used. The shell would also coordinate commands between the two programs.

► What is natural language software?

The meaning of the term "natural language" differs from one package to the next. What all natural language software have in common, though, is that they accept non-standard input commands. Also, each program uses some form of pattern recognition to affect its natural language.

There is a built-in vocabulary of commands that the software accesses whenever a word is entered at the prompt. If the input does not match any word in the vocabulary, the system begins reading the input, letter by letter, and checking it against the commands until it finds a possible match. Depending upon the complexity of the interface, a natural language program will check for transpositions, missing letters, common misspellings and syntax errors. If it finds a match, it inquires if the command found is the one requested. Some more elaborate systems allow users to define their own commands. For example, a user can define the phrase "grab it" to mean "locate".

► What are the differences between buffers and spoolers?

Both buffers and spoolers allow the user to dump text for printing at a later time. But they take opposite approaches.

Buffers make use of hardware; that is, they contain their own memory chips to store the dumped information. The computer, no longer involved with the printing of text, is freed for other tasks. Spoolers, on the other hand, are software programs that assign a certain amount of the computer's memory to function as a buffer. But spooler-created storage can only be used if your computer has memory to spare. Although 64K is usually cited as adequate for a machine, it will probably be too little to use with a spooler, especially if you run programs that need considerable RAM. Another disadvantage is that the text can only be printed when the computer has free time. On the positive side, print spooler programs cost much less than buffer box hardware.

► When should I use batch files?

Batch files are a collection of commands which are automatically executed from DOS. (Batch files is an MS-DOS term, but CP/M also has a similar feature—the Submit command.) Batch files are used whenever you want to save the time of inputting commands, assure yourself that certain procedures are executed, or run a series of operations in sequence. DOS will execute the first command within the batch files; once that command is completed (which can involve running a program), DOS returns to the next command in the sequence. When there are no more commands, the file returns control to the user.

Batch files are useful in startup procedures (checking memory on a hard disk, asking for the date and time); sending control codes to the printer, maintaining home control programs, logging onto bulletin boards, and performing backup operations at the end of the day. But they cannot execute a programming language and automatically return to the next command. Once the language is loaded, the system will wait for input and never return to DOS, leaving the batch file unfinished.

BUYING SMART

• **Try out a Kaypro computer before you buy.** If you want to make sure that Kaypro is the micro for you, or if you need a computer for too short a period to justify buying it, you can rent any Kaypro 8-bit machine from a computer retailer. The Kaypro Pro-Rent program, financed by Greyhound Computer Corporation, will let you even apply part of the rental payment toward a computer purchase should you decide you want to own one. Charges reflect local rates. For instance, monthly computer rentals in the San Francisco region (generally regarded as a high-cost area) average 7% of the cost of the machine. Thus, the monthly rental for the popular Kaypro 2, which

retails for \$1,295, would be approximately \$91.

• **Are you paying too much for long-distance telephone service?** When you use your modem? Charges for the same calls can vary widely, according to an evaluation of eight major long-distance telephone companies. Carried out by Consumer's Checkbook, a non-profit group based in Washington, DC and San Francisco, the study indicates that the difference is based not on the carriers' actual rates, but largely on how they measure the duration of a call. Some companies were found to charge for no answers, busy signals, and other types of incompletely completed calls—Western Union's Metrowone System, for one. Also, users are frequently charged up to 40 seconds per call in excess of the actual length of time of the

call. AT&T, for instance, charged 29 seconds more, even though they were accurate in all other ways. ITT Niteline, on the other hand, did not charge at all for calls of less than 30 seconds. SBS Skyline billing was found to be the most generous, on the whole.

To obtain a copy of the study, "The Complete Guide to Lower Phone Costs" (\$6.95), to be published this summer, write: *Washington Consumer's Checkbook, Suite 925, 806 15th Street, N.W., Washington, DC 20005*.

• **Do you want to win a Mercedes-Benz 190 sedan?** It costs nothing to enter this contest for the luxury sedan. Your only commitment is participation in a demonstration of NPL Information Management System at

(continued on page 6)

Second Computers

• Two new MS-DOS lap computers, have the potential for performing many functions of "full-size" desktop PCs, have been introduced as we go to press. Both are priced just below \$3,000.

Hewlett-Packard's "the Portable" (or HP-110) features a flip-up, 16-line by 80-column LCD display; a full-size keyboard; 272K of RAM; a built-in modem; and three software packages built into ROM, including Lotus 1-2-3, the Personal Applications Manager operating environment, and the MemoMaker word processing program. The 9-pound MS-DOS machine retails for \$2,995. A 5-pound, 3.5-inch disk drive is available for \$795. Also available is a portable-desktop interface package. It includes a circuit card and software and costs between \$125 and \$150.

Morrow Pivot is the first MS-DOS system introduced by this manufacturer of CP/M computers. Measuring 13 by 5.6 by 9.5 inches (or 13 by 13 when the keyboard folds out), the Pivot features a 16-line by 80-column LCD. A modem and either one or two 5½-inch disk drives are also built in. NewWord word processor, SuperCalc II spreadsheet, and communications software are in ROM. The Pivot comes in three models — one or two-disk versions with 128K of RAM, or a 512K version. Prices begin at just below \$3,000. The weight of a Pivot with two disk drives and a rechargeable battery pack (good for 6 to 8 hours) is 10 pounds.

• Epson PX-8, another lap computer, will appear on store shelves this year. The CP/M machine, already introduced in Europe, is an upgraded version of the pioneering but under-featured HX-20. The PX-8, which will retail between \$1,000 and \$1,200, has an 8-line by 80-column LCD display and 64K of RAM. It retains the HX-20's built-in microcassette storage but will also use external 5½-inch disk drives. Built-in software from MicroPro includes Portable WordStar, Calc, and Scheduler.

• T-Base is a relational database for lap computers priced at \$99.95. It allows users to maintain multiple files of information and to copy data between them. Files can also be linked to one another. T-Base capabilities include creation of custom LCD or printed reports, and insertion of formulas for automatic recalculation upon change of any variable.

T-Base is currently available for the TRS-80 Model 100, NEC PC-8201 and the new Olivetti M-10 portables. Olivetti has also been licensed to produce other Traveling Software programs, including the Traveling Writer, a word processor. *Traveling Software, Inc., 11050 Fifth Avenue, Seattle, WA 98125, 800-343-8080.*

BUYING SMART (continued)

an authorized dealer, where you fill out your entry blank. The program is available in versions for IBM PC and XT, Apple II and III, DEC Rainbow 100 and Pro 350, and other micros. Versions for the Apple Macintosh, HP 150 and Texas Instruments Professional are also being developed. The NPL Information Management System is priced at \$330 for an Apple II with 64K memory, and \$390 for a 256K Apple III. The versions for 16-bit machines generally cost \$500 and require 256K memory. The DEC Pro 350, which features a help screen, menus and commands, is an exception. It is priced at \$800.

• **dBase II/dBase III.** Following the introduction of the dBase III 16-bit management database system, Ashton-Tate has lowered the price of dBase II. This best-selling system for 8-bit and 16-bit computers has been reduced \$200 to \$495. dBase II users who

want to convert to dBase III, may purchase a pre-addressed Ashton-Tate carton for \$200 retail. The dBase II system disk and documentation should be returned to Ashton-Tate along with a coupon order form. Within 48 hours, the new system should arrive. This offer expires July 31, 1984.

BMR subscribers can now receive monthly reports for more than one make of computer. The charge for this service (which includes first-class mailing of the monthly newsletter with inserts) is \$10/yr. per additional computer make.

Reports are available for:

- Apple
- Atari
- Commodore
- IBM
- Kaypro
- Osborne
- Texas Instruments
- Timex Sinclair
- TRS-80

TOOLS AND CONCEPTS

• **Franklin CX Series** portable personal computers incorporate up to three different operating systems —Apple-compatible, CP/M and MS-DOS. All four CX models weigh 25 pounds and feature 7-inch screens and 64K of RAM. They come with Franklin DOS (Apple) and the Office Manager software package which integrates word processing, electronic spreadsheet, and graphic design and spelling checker functions. It also provides icon-type prompting aids. The four user-upgradable models and their retail prices are: CX-1, a single-drive system (\$1,395); CX-2 with dual disk drives (\$1,695); CX-2C, which includes a CP/M card with an additional 64K RAM and WordStar (\$1,995); and CX-2M, which provides MS-DOS with an additional 128K RAM and Word Star (\$2,295). Optional features include a 300/1200 baud modem; an MS-DOS memory upgrade to 256K; and blank templates to reformat keyboards. *Franklin Computer 1070 Busch Memorial Highway, Pennsauken, NJ 08110. 609-488-0600.*

• **ITT XTRA**, the newest MS-DOS compatible, is based on the 8088. It comes in two basic models — a single floppy disk version with 128K of RAM for \$3,500, and a 10MB hard disk version with 256K for \$6,000. The units also include five bus compatible expansion slots, serial and parallel ports, and a 14-inch, tilt/swivel monochrome monitor. Since the ITT XTRA has its own version of DOS 2.11, it is unlikely that IBM programs will run without modification. However, some programs are already being offered, including Multiplan, WordStar and EasyWriter 1. As for optional peripherals, the most interesting, perhaps, is a mouse that runs ITT's VisuALL

windowing program. *ITT Information Systems, P.O. Box 52016, Phoenix, AZ 85072. 800-528-1400.*

• **NEC Advanced Personal Computer III.** This business computer runs both the MS-DOS and UNIX operating systems. It is claimed to be lower priced and to give higher performance than equivalent IBM PC or other IBM-compatible systems. All APC III models include an 8MHz (vs. 5MHz for IBM) 16-bit microprocessor; 128K of memory, expandable to 640K; and a 30KB-per-second transfer rate. A 10MB hard disk with a 625KB-per-second transfer rate is optional. There are three standard APC III configurations: a single disk drive system (\$1,995); a dual-drive system (\$2,995); and a system with both a floppy and a hard disk drive (\$3,995). The Advanced Personal Computer III has functional IBM compatibility, and a growing library of business and productivity software. It includes WordStar, dBase II, the PFS Series and other major programs. *NEC Information Systems, Inc., 1414 Massachusetts Ave., Foxborough, MA 01719. 617-264-8000.*

• **OmniReader** is a hand-held optical reader. It can read typewritten material into a microcomputer or word processor in less than four seconds per line. Presently available are the four most common fonts: Prestige Elite 12, Courier 10 and 12, and Letter Gothic 12. OmniReader can also "learn" non-standard fonts by downloading the font from the computer or scanning it with the OmniReader in a preset format.

The British-made device connects to any RS-232C port. It uses a proprietary electronic scanning head, and a specially engineered ruler to ensure accurate registration

SOFTWARE MART

• **Safeguard Natural Language Software Package** is a small business-oriented book-keeping system that enables IBM PC and XT computers to understand and respond to conversational English. There are no languages to learn or instructions to remember. Instead, in their own words, users enter questions and instructions related to specifically defined applications. Typical system tasks include accounts receivable, invoicing, listing unpaid balances, credit checks, tracking sales performance by salesperson and territory, and posting of sales and cash receipts. When a color monitor is used, entries and computer responses appear on the screen in different colors. The Natural English Processor Program provides the package's artificial intelligence. It was developed for Safeguard, a marketer of manual systems for small businesses, by the Plain English Software Corp. of Towson, MD, 301-583-8442. Plain English is cur-

rently considering other applications to be marketed independently, such as spreadsheets and stock market quote system enhancements.

The Natural Language Package will be marketed to small firms which gross \$1 to \$5 million and generally lack time and resources to train employees in the use of new computer software and equipment. The \$895 package runs on IBM PC and XT computers with 128K and two disk drives. For additional information, contact: *Safeguard Business Systems, Inc., 400 Maryland Drive, Fort Washington, PA 19034. 215-641-0500.*

• **dBase III** is the 16-bit upgraded version of the widely used dBase II database management program. The new DBMS has a vastly enhanced storage capability of up to two billion records per file (compared to 65,000 for dBase II) and 128 fields per data

(continued on page 8)

by the user. It can read the text selectively; that is, the user can have the scanner read only those words or phrases in a line of text that he needs. The movable track clock allows the scanner to read text at variable speeds so a user can manipulate the device at his own rate.

Available later this year, OmniReader's suggested retail price will be under \$500. *Oberon International, 5525 MacArthur Blvd., Suite 630, Lockbox 48, Irving, TX 75062. 214-257-0097.*

• **Supercord II**, a \$349 computer/electronic typewriter interface, is designed to provide an alternative to printers. Because the interface includes a 4K memory buffer, data can be stored until the typewriter is ready to process it. Supercord connects to IBM, Apple, Atari, Commodore, TRS-80 and other personal computers, and Adler, Brother, Royal, Smith-Corona and Silver-Reed electronic typewriters. *Cord Ltd., 1548 Brookhollow Drive, Santa Ana, CA 92705. 213-595-4446.*

• **ECPC Cartridge Programming Systems** allow you to program cartridges for the IBM PCjr. or the TI 99/4A. Designed to program Romox ECPC (special EPROM-based) blank cartridges, the units transfer 8K programs to cartridges in less than two minutes. The PCjr version (\$499.95) requires 128K and is attached to the side port. The TI 99/4A version (\$300) requires 32K, disk drive and controller. Both systems come complete with software and manual. Individual blank cartridges cost \$20. *Navarone Industries, 510 Lawrence Expressway, #800, Sunnyvale, CA 94086. 408-866-8579.*

• **Data Sentry**, an intelligent modem, provides security for micros, minis and main-

frames by using a call-up, call-back, password sequence. No encryption or change in systems programming is required. When accessed, the \$895 modem checks a list of authorized numbers; if the number is valid, it calls back and requests a password. Three attempts at the password are allowed. Data Sentry features 30/1200 baud, full duplex, auto dial, auto answer, auto speed and auto parity selection. An optional \$145 device, Remote-ON, enables the user to turn the computer on or off once security has been cleared. *Lockheed-Georgia Company, Getex Division, Marietta, GA 30063. 404-951-0878.*

• **Ziyad's Z-300 Intelligent Paper Processor** sports a unique name-and-address-capture feature. This feature memorizes the name and address in a letter when it is being entered and then automatically prints out and sorts the envelope along with the letter. The \$2,600 unit comes with two paper trays and an integral envelope tray, so users can choose from a variety of portrait and landscape paper sizes in any sequence. *Ziyad, Inc., 100 Ford Road, Denville, NJ 07834. 201-627-7600.*

WANTED... WANTED... WANTED...
Freeware, public domain software announcements. We will selectively publish information concerning new no-charge or suggested-donation application software for Apple, Atari, Commodore, IBM, TI, TRS-80, CP/M and MS-DOS computers. Send announcements — including charges or donations, and full ordering address — to *Freeware/Public Domain Software Editor, Baron's MicroComputing Reports, 344 E. 49th St., New York, NY 10017.*

DATA BRIEFS... (continued)

windows, graphics, networking, 8087 math processor support, improved performance and MS-DOS compatibility. MicroSoft, too, is upgrading its system, starting with the recently announced Windows facility. Both operating systems may have the unique features preferred by some users. But which IBM will choose to support will depend heavily on the support each system receives from application software developers. To date CP/M-86 has largely been ignored because of its limited use.

○ **Help for user groups.** The World Users Exchange (WUE) helps user groups promote the exchange of computer information and aids them in planning and upgrading services to members. Solutions to actual problems encountered by groups are presented in the WUE newsletter. For additional information, write to the *World Users Exchange, POB 12132, Roanoke, VA 24022.*

○ **Teenagers' micro use doubling.** Personal computers are being used and bought by U.S. teenagers at a rate almost double that in late 1983. According to a survey of teens conducted by Teen-age Research Unlimited, nearly 20% of 1,500 respondents had used a personal computer within the previous week compared to 10.2% six months earlier. In addition, 9% had purchased a personal computer in the year past, double the rate for the prior year. Teens' growing interest in computers has led to a declining interest in arcade video games. The number of respondents who had played these games in the previous three months declined to 32.7% from the 40.9% figure six months before.

○ **Library management clearinghouse.** The non-profit Library Micro Clearinghouse sponsors the exchange of library application templates for use with public domain software. Librarians are encouraged to duplicate the templates and share the adapted programs with other librarians. Templates cost \$5 and \$7.50 for single and double-disk versions respectively. Initial support is for VisiCalc and DB Master application templates for the Apple IIe. For information, contact *Eric Anderson, Micro Computer Libraries, 145 Marcia Drive, Freeport, IL 61032.*

○ **The Electronic Mall** service developed by CompuServe, Inc. and I.M. Berry & Co., a publisher of Yellow Pages directories, allows CompuServe subscribers to shop from home for merchandise and services of over 80 national firms. The Mall, on-line 24 hours a day, seven days a week, provides product descriptions, capability to ask questions about specific products, and electronic mail and order forms for communications with suppliers. *CompuServe, Inc., 5000 Arlington Centre Blvd., POB 20212, Columbus, OH 43220. 614-457-8600.*

SOFTWARE

(continued)

base. Up to 10 database files can be used simultaneously. The speed of sorting, indexing and other file operations has also been increased. The internal guide, dBase Assistant, provides new users with prompts to the most common areas of database use. Moving the cursor to a dBase command word brings a description of that category of database usage to the screen. Pressing the return key brings a menu of possible options for that category. Other user interactive features include an on-line help system.

Like dBase II, dBase III comes with a programming language for developing customized applications and manipulating stored data. Similarly it, too, is attracting extensive third-party software developer support. Fox & Geller has announced it is bringing out new versions of its Quickcode program generator, dUtil utility, and dGraph graphics programs.

Written in C language, dBase III is specifically directed to 16-bit and larger compu-

ters. (dBase II will continue to be supported and enhanced for 8-bit computer users.) It runs on IBM PC, XT and compatible computers with at least 256K and two disk drives. Suggested retail price is \$695. A demo version containing an interactive tutorial is available for \$9.95. *Ashton-Tate, 10150 West Jefferson Blvd., Culver City, CA 90230, 213-204-5570.*

- **CorrectStar** is MicroPro's \$195 spelling checker that interfaces with WordStar. It not only permits verification of misspellings but also suggests corrections. Its 65,000-word data base comes from the American Heritage Dictionary and contains 99% of the most frequently used English words. Flagged words can be corrected or bypassed and paragraphs are automatically reformed after corrections.

In addition, the program automatically boots 9,000 common words into RAM for faster response time, permits the user to insert up to 1,500 specialized words, and offers soft-hyphen help. Maintenance is unnecessary since the 1,500-word specialized dictionary is edited as a WordStar file.

Available now for the IBM PC (192K). CorrectStar versions for DEC, TI Professional, and TRS-80 Model 2000 are forthcoming. A \$95 upgrade is available for SpellStar owners. *MicroPro International Corp., 33 San Pablo Avenue, San Rafael, CA 94903, 415-499-1200.*

- **The Management Edge** is one of three "expert" programs developed by Human Edge Software. (An expert system is the decision process a specialist in a given field uses to solve a problem, coded into a program that laymen can use.) This two-disk program addresses managerial problems. It helps resolve interpersonal conflicts, increase motivation and productivity, improve communications, and develop an employee career plan. The process begins with user response to on-screen statements which kick off an interactive dialogue.

The other two products are: The Sales Edge and The Negotiation Edge. Each is \$250 and runs on the Apple, the IBM PC and compatibles. *Human Edge Software Corp., 2445 Faber Place, Palo Alto, CA 94303, 415-493-1593.*

Words Processed

• **Practical WordStar Uses.** By Julie Anne Arca. 298 pages. Sybex. \$16.95, paper. When I first began reading this book, I wondered whether someone had swapped covers on me. The first chapter was devoted to DOS — creating file names, using wild-card symbols, even logging onto another drive. True, the second chapter dealt with WordStar, but I was still a little uncomfortable with the cartoons used to illustrate the text. In the third chapter, I was certain the books had been switched back again — WordStar menus greeted me on almost every page.

The remaining chapters, however, more than made up for the initial confusion. Among the topics covered in the "WordStar Applications" section are form letters, boilerplates, stored ruler lines, outline formats and variable margins. In each chapter there is an example that takes you step by step through the procedure. Exercises are divided in two columns: "You Enter..." and "WordStar Comments and Important Notes".

The "MailMerge Applications" section takes the examples already given and builds upon them. Such topics as assigning titles and values to variables, and inserting operator-supplied information are explained and demonstrated in concise terms.

Except for attempting to have "a little something for everyone", *Practical WordStar Uses* is very well-planned and useful. In fact, it was invaluable in the preparation of the "More Than Words Processed" article

which appear on page 1 of this issue.

• **Lee's Guide to Published Computer Programs: Where to Find Free Programs for Your TRS-80, Apple or IBM Microcomputer.** By Henry Lee, PhD, Pasadena Technology Press. \$14.95, paper. The two volumes in this guide index Basic programs published in computer books and magazines from 1979 through 1983. Assembly programs are also included. Of over 8,000 programs, none are from *Compute!*, one of the leading magazines with program listings. Also, my review copy was missing page 12 of Volume 1, part of the bibliography of indexed books. Fortunately, the information is scattered throughout the rest of the volume. These two omissions make me suspect that there might be other errors. I also question the validity of a work that makes no attempt to validate the usefulness and runability of any of the programs. For example, how would a reader know whether a program published in a magazine was amended in a later issue?

• **The Elements of Friendly Software Design.** By Paul Heckel. 192 pages. Warner Books. \$8.95, paper. This book should be required reading for all programmers because it raises most of the important questions on software design. Even if you are not a programmer, this book can help you purchase software more intelligently. Heckel defines 30 principles of friendly software design, including reducing the user's defensiveness, giving the user control and preventing programming mechanics from

overshadowing performance. VisiCalc is used throughout the book as an example of good design.

Two complaints: The first is the liberal use of quotes at the beginning of each chapter. While they are interesting, these interfere with the main thrust of the book. Secondly, by including his own company's programs as examples of friendly software design, Heckel undermines his objectivity.

• **The CompuThink Guide to Spreadsheet Software.** Howard W. Sams & Co., Inc., \$11.95, paper. This guide is intended to help users identify their needs and select the appropriate program. Training costs and special software and hardware options are addressed. The book also discusses the general limitations of spreadsheets, productivity, and whether spreadsheets are worth the investment. Since a spreadsheet is only as good as its features, the book explains those of LisaCalc, Lotus 1-2-3, Multiplan, SuperCalc2, VisiCalc, and others.

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PERSONALIZED REPORT FOR: **TRS-80**

July, 1984

Alan B. Abrahamson, Technical Editor

* **SOFTWARE REVIEWS**

o **INDEX COMPILER**

This \$65 package does what its name implies. It helps writers prepare book indexes from hard copy. The program executes on a Model I or III only in a TRSDOS environment.

Once the machine language program is loaded in, you are put into disk Basic. The functions that appear on the menu screen are concise and easily understood. You first choose the ADD mode to create your list of key words to be indexed. Entries are input in a pre-defined manner with the keys, sub-keys and page numbers separated by a comma and a space. If you are not consistent in making your entries, your index will be unsatisfactory.

After the index data has been entered, you can edit or delete any item. Normally, though, you would first sort your list. The sort is a fast machine language module. Then, you might wish to combine duplicate entries by selecting the "G" option on the menu, an especially useful feature.

To format the index for printout to your printer, you would use the "I" option. A good example of how this formatting function works is given in the documentation. Suppose your entries are:

Silver, 129-131, 179-181
Silver, certificates, 5, 132, 181-182
Silver, certificates, issue of, 169
Silver, certificates, not lawful money, 782
Silver, coinage of, 169, 182

After using the I function, your index file would look like this:

Silver, 129-131, 179-181
certificates, 5, 132, 181-182
issue of, 169
not lawful money, 782
coinage of, 169, 182

Another option in Index Compiler is the ability to save or load your index to disk so that you can enter additional data at a later time. You can also see your data on-screen, moving a page at a time either up or down, and you can kill old indexes whenever you want to start afresh.

Index Writer is an intelligent, well-made program for a specific purpose. Authors who have been through the tedious process of indexing their work will most certainly appreciate its ease and efficiency. COMPRESS, P.O. Box 102, Wentworth, NH 03282. 603/764-5831.

o **LAZY WRITER**

Lazy Writer is not a text editor, nor a print formatter, nor a file handler nor a word processor—it is all four rolled into one system. David Welch, the designer, has created the most comprehensive system I have seen to date for the TRS-80 Models I, III and 4. If you have ever used a professional word processing system that costs at least \$15,000, like a Wang, you are familiar with its

powerful features. Now you can have these same features for your TRS-80 at the remarkably low price of \$175.

Lazy Writer contains all the standard features you would expect in a word processing package plus many other notable capabilities. One of the most important, and one that is seldom included in most word processing software on the market is the formatting of text prior to printing. This feature, which allows you to view your page breaks for manual correction, is by itself worth the price of the system.

Another feature worth mentioning is the "X-key." It allows you to customize many of the keystrokes you normally use into one-key commands. You have 10 definable "X-keys" at your disposal. The program also permits directory manipulation and file handling including the chaining of several files for printing.

Within the utility category, Lazy Writer includes a RESCUE utility to recover text on random boot, a STRIP utility to eliminate non-standard characters from text (an especially useful feature for communications), a SIZE utility to set high memory on your computer, a PRINTGEN utility to configure Lazy Writer to your particular printer and a CHANGE utility to set Lazy Writer's internal functions to your liking. This utility gives you control over tabs, cursor flash, delay, repeat key speed, case, screen display and several printer menu functions. There is also an INDEX creator as part of the FORMATTER utility, a serial printer driver and an RS232 driver. The distribution system is a mini Multidos, and contains a program called CHECK which verifies that your files have survived the mail service. Integration to the Electric Webster spelling checker system is also provided.

Lazy Writer has the capacity for just about every text-processing task you can imagine: Headers, footers, page numbers, superscripts, subscripts, indents, reverse indents, graphics, etc. are all handled with ease. Most commands are accomplished with one or two keystrokes. Movement between the modules of the two-part process for entering and editing text is accomplished instantly with a touch of the BREAK key.

There is a special bonus for Model 4 users: Lazy Writer takes full advantage of your 80-character screen in Model III or 4 mode. You can still have use of the function keys should you redefine the keyboard to Dvorak, for example. Another utility called FAST/CMD allows use of the faster Model 4 clock speed in Model III mode. In fact, Lazy Writer can be used as a general utility for the Model 4 in Model III mode.

If you find it difficult to learn new programs, Lazy Writer provides onscreen help at the touch of a key. Most command syntax is explained, and the file can be altered to your liking.

If Lazy Writer's basic system lacks some capability you need, you can consider some of the many extension programs that are available for it at additional cost. I have not yet reviewed any, but judging by the quality of the Lazy Writer, I would expect them to be of equally high caliber. Six of the extension programs are: LAZYMERGE, a mail/merge extension program that also works with Postman; LAZYSFONT, a creative font lettering program; LAZYDRAW, a screen graphic generator; LAZYCALC, math functions integral to word processor program; LAZYDOC, a boilerplate document producer; and LAZYTYPING, a mini-spooler for Models I and III. AlphaBit Communications, Inc., 13349 Michigan Avenue, Dearborn, MI 48126. 313/581-2896.

o SOFTPAC

SoftPac is an integrated software system that combines word processing, database management, spreadsheet analysis and communications. The \$299 system is designed for the Model III and 4, and is supplied with a backup on a copy-protected diskette. It is menu-driven, user-friendly and capable of most of the tasks you might need to have performed.

SoftPac's word processor, SoftWriter, has adequate commands for most non-professional users. The database handler, SoftBase, is probably the most comprehensive of the modules--a new, in-memory data base can be constructed in minutes and searched in many different ways. The SoftTerm communications system is good, especially if you have a Hayes modem. It will autodial from menu for you and execute all of the Hayes Smartmodem commands.

There are some limitations, however. Many are due to the fact that the programs are coded in Basic and compiled with the ZBASIC integer compiler. In the SoftCalc module, a VisiCalc-type spreadsheet analyzer, you have no control over column width. Therefore, you can only enter five alpha or numeric items in a cell. Also, you can use only integer values, not decimals--a severe limitation for many applications. Another problem is the lack of automatic re-calculation. If you change a value, you must re-total the columns and/or rows one at a time.

In view of these limitations, why would you consider this package? The answer is integration. All modules are designed to function from within the others. Data can be interchanged between any of the modules. You can, for example, download a spreadsheet by communications, move it to the word processor for edit, send it back to the calc program for recalculation and even tap some of the data from the database handler. Data processing is handled this way on large mainframe computers, and this is an ideal way to run a system.

Caveat: The system runs on Model III or Model 4 (Model III mode) only. Support for operating systems other than TRS-DOS 1.3 is not guaranteed. In fact, one Softronics technician has said, "Since Radio Shack is no longer producing the Model III computer, they may be dropping support of the Model III." Softronics Computer Systems, 2300 East 14th Street, Suite 201, Tulsa, OK 74104. 918/749-6211.

* ASK ALAN - RANDOM FILES

- o QUESTION: I have a Model III. Can you help me with the concept of Random Files? I don't seem to understand what a "BUFFER" is and what it is I am supposed to do with it.

ANSWER: The concept of a "BUFFER" should be relatively easy to understand. (The technique described will apply to Model I, III or 4 with any TRSDOS-type operating system.) Somewhere in your computer's memory (RAM), your operating system has allocated a workspace, normally 256K bytes long, for data being transferred to and from disk. This workspace is controlled by your program, using the following commands:

OPEN "filename", buffer#, filename:drive#. This command establishes your file on disk within the system, and directory entry is set up when you issue it.

FIELD buffer#, number-of-bytes AS buffer-variable,.....etc. This command constructs the buffer to your liking. For example, with a mailing list you might allocate an appropriate amount of space to such buffer-variables as LASTNAMS\$, FIRSTNAMS\$, ADDRESS\$, CITY\$, STATE\$ and ZIP\$.

LSET buffer-variable = string-variable; or RSET buffer-variable = string-variable. The only difference between these two commands is that LSET will place the information to the left side of the buffer-variable space and RSET will do the opposite.

PUT buffer#, record#. This command sends information in buffer to disk as the record number in the file (indicated by the value of record#).

GET buffer#, record#. This command is the opposite of the above, and will retrieve information from the appropriate disk record number and place this record in the assigned buffer#.

CLOSE buffer#. This command tells the system to close the directory entry on disk, set the EOF (End Of File) byte and flush the buffer information if it has not previously been written. This only happens if you are using record lengths that are less than 256 bytes.

So now you have a working system for getting and retrieving information from disk in Random file mode. The real name for this mode should be Direct and not Random since there is nothing random about what the system does with your information.

Here are some short sample programs that may help you better understand the random file mode of the TRS-80. (Note: The single quote, " '", signifies REM.)

Data Input Demo

```
10 CLEAR 1000 'Make some string space
20 CLS 'Start with a fresh screen
30 OPEN "R", 1, "TESTFILE:0" ' Establish the file called testfile in buffer
#1, Drive # 0
40 FIELD 1, 20 AS LASTNAM$, 15 AS FIRSTNAM$, 25 AS ADDRESS$, 15 AS CITY$,
2 AS STATE$, 5 AS ZIP$
50 LINEINPUT"LAST NAME: ";A$: LSET LASTNAME$=A$
60 LINEINPUT"FIRST NAME: ";A$: LSET FIRSTNAM$=A$
70 LINEINPUT"ADDRESS: ";A$: LSET ADDRESS$=A$
80 LINEINPUT"CITY: ";A$: LSET CITY$=A$
90 LINEINPUT"STATE: ";A$: LSET STATE$=A$
100 LINEINPUT"ZIP CODE: ";A$: LSET ZIP$=A$
110 PUT 1, 1 ' Send record 1 to file testfile via Buffer 1
120 Close 1 ' Close buffer 1 (end of program)
```

Data Retrieve Demo

```
10 CLEAR 1000: CLS
20 OPEN "R", 1, "TESTFILE:0"
30 FIELD 1, 20 AS LASTNAM$, 15 AS FIRSTNAM$, 25 AS ADDRESS$, 15 AS CITY$,
2 AS STATE$, 5 AS ZIP$ 'Set up buffer for data
40 GET 1, 1 ' Retrieve 1 record from file
50 PRINT LASTNAM$: PRINT FIRSTNAM$: PRINT ADDRESS$
60 PRINT CITY$: PRINT STATE$: PRINT ZIP$
70 CLOSE 1 'Close buffer 1 (end of program)
```

There are other commands that you can use to structure your programs, but they are a little more complex to use and understand. They may be a subject for a future column. In the meantime, you can refer to your disk system operating manual for details on these: LOF(buffer#), LOC(buffer#), EOF(buffer#), CVI(buffer-variable), CVS(buffer-variable), CVD(buffer-variable), MKI\$(numeric-variable), MKS\$(numeric-variable) and MKD\$(numeric-variable).

* TYDBYTES

TIMER

Here is a simple little routine for calculating a program's elapsed time. It takes the information stored in the TIME\$ function of your DOS and reduces it to a common denominator. Using DEFined Function, it converts all time data into seconds so that the elapsed time can easily be calculated. If the result is greater than 59 seconds, other routines can be added to reconvert the total into an hour/minute/second figure. But this enhancement I leave to you; the algorithm already exists in the code below:

```
10 REM Copyright 1982, Alan B. Abrahamson Filename: TIMER
    Variables used in program: T1$ = Start time and date string. T2$ = Stop
    time and date string. FNIM = Algorithm to convert hh:mm:ss format to seconds.
20 CLEAR 500 : CLS
30 REM Function below converts the string returned from the TIME$ function into
seconds.
40 DEF FN TM ( TM$ ) = 3600 * VAL ( MID$ ( TM$,10,2 ) ) + 60 * VAL ( MID$ ( TM$,13,2 ) )
+ VAL ( MID$ ( TM$,16,2 ) )
50 PRINT : PRINT "Hit any key to START timer ..... ";
60 IF INKEY$="" THEN 60 ELSE T1$ = TIME$: PRINT RIGHTS(T1$,8)
70 PRINT "Hit any key to STOP timer ..... ";
80 IF INKEY$="" THEN 80 ELSE T2$ = TIME$: PRINT RIGHTS(T2$,8)
90 PRINT "Elapsed time ="; FNIM ( T2$ ) - FNIM( T1$ );"seconds": GOTO 50
```